

CLAIMS

1. A fuel reforming apparatus comprising an assembled unit of a reformer with its associated instruments, characterized in that the assembled unit of the reformer with the associated instruments is covered with and enclosed by a vessel to form a heat insulating layer therearound.
2. The fuel reforming apparatus according to claim 1, wherein the vessel is a vacuum heat insulating vessel with inner and outer cylinders and a vacuum heat insulating layer therebetween.
3. The fuel reforming apparatus according to claim 1 or 2, wherein an interior of the vessel is utilized as a flow path of combustion gas for the reformer.
4. The fuel reforming apparatus according to claim 3, wherein the reformer comprises a furnace flue through which combustion gas from a combustor flows and a plurality of reforming tubes arranged side by side in a flow path of the combustion gas between the furnace flue and the vessel and having reforming catalysts charged therein for flowing of the source gas therethrough for

reforming of the gas.

5. The fuel reforming apparatus according to claim 1 or 2, wherein the associated instruments of the reformer include

a water vaporizer for vaporizing water into water vapor through heat of the exhaust gas from the reformer,

a low-temperature shift converter for lowering the gas reformed by the reformer to a required temperature so as to transform CO and H₂O into CO₂ and H₂ and

a CO remover for cooling the reformed gas having passed through the shift converter so as to remove CO.

6. The fuel reforming apparatus according to claim 3, wherein the associated instruments of the reformer include

a water vaporizer for vaporizing water into water vapor through heat of the exhaust gas from the reformer,

a low-temperature shift converter for lowering the gas reformed by the reformer to a required temperature so as to transform CO and H₂O into CO₂ and H₂ and

a CO remover for cooling the reformed gas having passed through the shift converter so as to remove CO.

7. The fuel reforming apparatus according to claim 4, wherein the associated instruments of the reformer include

a water vaporizer for vaporizing water into water vapor

through heat of the exhaust gas from the reformer,

a low-temperature shift converter for lowering the gas reformed by the reformer to a required temperature so as to transform CO and H₂O into CO₂ and H₂ and

a CO remover for cooling the reformed gas having passed through the shift converter so as to remove CO.

8. The fuel reforming apparatus according to claim 5, wherein the associated instruments of the reformer include a primary fuel gasifier for gasifying primary fuel through heat of said exhaust gas.

9. The fuel reforming apparatus according to claim 6, wherein the associated instruments of the reformer include a primary fuel gasifier for gasifying primary fuel through heat of said exhaust gas.

10. The fuel reforming apparatus according to claim 7, wherein the associated instruments of the reformer include a primary fuel gasifier for gasifying primary fuel through heat of said exhaust gas.

11. The fuel reforming apparatus according to claim 5, wherein the associated instruments of the reformer include a desulfurizer for desulfurizing source gas to be fed to

the reformer.

12. The fuel reforming apparatus according to claim 6, wherein the associated instruments of the reformer include a desulfurizer for desulfurizing source gas to be fed to the reformer.

13. The fuel reforming apparatus according to claim 7, wherein the associated instruments of the reformer include a desulfurizer for desulfurizing source gas to be fed to the reformer.

14. The fuel reforming apparatus according to claim 8, wherein the associated instruments of the reformer include a desulfurizer for desulfurizing source gas to be fed to the reformer.

15. The fuel reforming apparatus according to claim 9, wherein the associated instruments of the reformer include a desulfurizer for desulfurizing source gas to be fed to the reformer.

16. The fuel reforming apparatus according to claim 10, wherein the associated instruments of the reformer include a desulfurizer for desulfurizing source gas to be fed to

the reformer.

17. The fuel reforming apparatus according to claim 5, wherein the CO remover is a selective oxidation CO remover or a methanator.

18. The fuel reforming apparatus according to claim 6, wherein the CO remover is a selective oxidation CO remover or a methanator.

19. The fuel reforming apparatus according to claim 7, wherein the CO remover is a selective oxidation CO remover or a methanator.

20. A method for starting a fuel reforming apparatus wherein an assembled unit of a reformer with its associated instruments is covered with and enclosed by a vessel to form a heat insulating layer therearound, an interior of said vessel being utilized as a flow path of combustion gas for the reformer, the associated instruments or a water vaporizer, a low-temperature shift converter and a CO remover being arranged in said flow path, characterized by

burning startup fuel without supply of primary fuel to the reformer so that resultant combustion gas from said

burnt startup fuel is heat exchanged with no primary fuel in the reformer and is guided to said flow path while being still hot, whereby the combustion gas flows around and heats the shift converter and the CO remover.